GOVERNMENT OF INDIA
SCIENCE AND TECHNOLOGY
LOK SABHA

UNSTARRED QUESTION NO:2021
ANSWERED ON:09.03.2016
Laser Interferometer Gravitational Observatory
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Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether the Government proposes to set up the world"s third Laser Interferometer Gravitational Observatory (LIGO) in India and if so, the details thereof;

(b) the advantage of setting up this observatory;

(c) the estimated cost to be incurred for this mega science project;

(d) whether the setting up of ground based detector will form a triangulate with the US detectors and will help to locate the source of a gravitational waves and if so, the details thereof; and

(e) the time by which the LIGO will be set up and made operational?

Answer

MINISTER OF SCIENCE AND TECHNOLOGY
(DR. HARSH VARDHAN)

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(bÃ‰. cÂÃ‰Ã‡ Â´Ã‰vÃ‰Ã‡xÃ‰)

(a) Yes, Madam. The world's third advanced Laser Interferometer Gravitational wave Observatory (LIGO-India) will be set up in India. The Union Cabinet has granted, in-principle approval, for the same on 17.02.2016. This project will be a mega science project to be jointly funded by the Department of Atomic Energy (DAE) and the Department of Science & Technology (DST). The LIGO-India observatory will be part of a global network with two other advanced LIGO observatories where scientific research has already started from September 2015. The LIGO-India observatory will be set up as a joint scientific collaboration between LIGO laboratories of the California Institute of Technology (Caltech) and Massachusetts Institute of Technology (MIT) of the USA and three lead Indian institutions, namely, the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, Institute for Plasma Research (IPR), Gandhinagar and Raja Ramanna Centre for Advanced Technology (RRCAT), Indore. This will be a nationally coordinated project and a number of other Indian institutions would also participate in this project.

(b) LIGO-India will be an important project in the field of fundamental sciences in the country. The observatory will be among the most precise scientific apparatus on the Earth, with technical capability of measuring displacements which are a billion times smaller than the size of an atom. This will help develop national capabilities in technological areas such as control systems, lasers and optics and vacuum technology well beyond the currently available expertise in the country. This will help train highly skilled scientific and technological manpower. The analysis of the measurements for obtaining the scientific results will involve very sophisticated computational and data handling infrastructure. Such a front-ranking scientific experiment on Indian soil will be a source of inspiration for young and budding scientists. This will help launch an entirely new discipline of gravitational-wave astronomy.

(c) The estimated cost to be incurred for the LIGO-India project is about Rs. 1260 crores. For this purpose, a Detailed Project Report will be prepared by the LIGO-India team.

(d) It is true that setting up of ground-based detector in India will form a triangulate with the US detectors which will help to locate the source of gravitational waves. The location of the observatory in India will have scientific advantage because of large separation with the two observatories in USA which will permit more refined triangulation of detected gravitational wave events.

(e) LIGO-India which is planned to be set up would be operational by the year 2023.

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